

OVERVIEW OF 1997 RAILROAD EMPLOYEE FATALITIES

EXECUTIVE SUMMARY

This document, entitled “1997 Railroad Employee Fatalities: A Comprehensive Study,” was designed to promote and enhance awareness of many unsafe behaviors and conditions that typically contribute to railroad employee fatalities. By furthering our understanding of the causes of railroad employee fatalities, this report is intended to assist railroad industry stakeholders in their efforts to prevent similar tragedies.

In addition to the individual narrative reports (provided in the past), this document contains the following *new* materials:

- Yard and accident scene diagrams which accompany 28 narrative reports for calendar year 1997 (***FE-1 through FE-45***);
- Narrative matrix entitled “Analysis of 1997 Employee Fatalities,” (***Appendix A***) which highlights important elements of each fatality, particularly the possible contributing factors (PCFs). This format allows the reader to walk through and analyze each fatality scenario, identifying ways the fatalities could have been prevented;
- Findings (***see below through Page 4***) which help to identify ***who*** the majority of fatally injured employees were (i.e. craft, job position, age group, years of service); ***when*** they were fatally injured (i.e. time of year, time of day); ***where*** the incidents occurred (i.e. region, type of railroad); and most importantly, ***why*** they occurred in terms of possible contributing factors; and
- Bar and pie charts (***Appendices B through J***) which illustrate the above findings.

COMPLEXITY OF FATALITIES

Fatalities usually resulted from a chain of events or the errors of more than one individual, as revealed by the PCFs for each fatality. Complexity of fatalities ranged from straight forward with only one PCF to very complex with as many as nine identified PCFs. Nearly 36 percent of the fatalities involved two PCFs, while 25 percent involved only one PCF. ***The remaining nearly 40 percent involved three or more PCFs.***

As an example of a very complex fatality, FE-03-97 involved the following PCFs:

- The fatally injured Car Inspector wore inappropriately, dark clothing at night;
- The Car Inspector experienced fatigue as a result of working his entire shift in overtime status;
- The Locomotive Engineer of the approaching train failed to sound the bell and illuminate the locomotive’s headlights per the railroad’s operating rule;
- The noise of nearby locomotives masked the sound of the approaching train;

- The Conductor's view was obstructed by the long hood end of the locomotive he was riding;
- The fatally injured Car Inspector had fouled the track;
- A pole-mounted light was diminished to total darkness by two adjacent locomotive consists approaching at the same time; and
- Yardmasters in the towers failed to notify all affected parties of yard movements as they usually did.

FINDINGS

WHO were most of the fatally injured employees?

- Over 80 percent of all 1997 employee fatalities were Transportation & Engine (T&E) or Maintenance-of-Way (MOW) employees. Half of all fatalities were T&E employees. *(See Appendix B, pie chart entitled "1997 Railroad Employee Fatalities by Craft.")*
- Nearly one third of all fatally injured employees were Conductors, as numerous as all fatally injured MOW employees combined. *(See Appendix C, stacked bar chart entitled "1997 Railroad Employee Fatalities by Craft and Position.")*
- Most fatally injured employees were very experienced. Over half had 21-35 years of experience, followed by nearly 18 percent each with 0-5 years and 11-20 years of experience. Half were 46-55 years old, while over 21 percent were 36-45 years old. Just under 11 percent were 18-35 years old. *(See Appendix D, a stacked bar and cluster bar chart entitled, respectively, "1997 Railroad Employee Fatalities: Years of Service by Craft," and "1997...Fatalities: Age Ranges by Craft.")*

WHAT were most of the employees doing when they were fatally injured?

- Nearly 40 percent of all fatally injured employees were involved in switching activities, followed by nearly 18 percent who were en route from home to work or class and vice versa. The remaining employees (one or two each) were fatally injured while applying an EOT device, enforcing trespassing laws, installing inter-track fencing, applying blue flag protection, cleaning and salting switches, maintaining track, aligning track, installing signal line boots and hose, installing catenary poles, performing a crew change, or inspecting cars. *(See Appendix E, stacked bar chart entitled "1997 Railroad Employee Fatalities By Craft and Activity.")*

WHERE did most of the railroad employee fatalities occur?

- Nearly 40 percent of all 1997 employee fatalities occurred in Regions 1 and 4, with none in Region 5. *(See Appendix F, bar chart entitled "1997 Railroad Employee Fatalities by FRA Region.")*

- Over 64 percent of all employee fatalities occurred on Class I freight railroads, nearly 22 percent on Class II and III freight railroads, and the remaining over 14 percent on commuter and passenger railroads. These railroad categories employed over 71 percent, slightly over 9 percent, and nearly 20 percent of the nation's total railroad employees, respectively. (*Also see Appendix F, bar chart entitled "1997 Railroad Employee Fatalities by Type of Railroad."*)

WHEN did most of the fatalities occur?

- Nearly half of all fatalities occurred in the winter and over 33 percent occurred in the summer. (*See Appendix G, pie chart entitled "1997 Railroad Employee Fatalities by Season of Year."*)
- Data of the U.S. Naval Observatory, Astronomical Applications Department, provided the precise times for sunrise and sunset for the specific dates of the fatalities. To distinguish fatalities which occurred during daylight from those which occurred during darkness, this analysis employs the definitions of "day" as at sunrise through sunset, and "night" as immediately after sunset until sunrise. Fatalities were split almost 60-40, night to day, respectively. (*Also see Appendix G, pie chart entitled "1997 Railroad Employee Fatalities by Time of Day."*)

WHY did most of the fatalities occur?

- The majority (over 65 percent) of all PCFs in the 28 fatalities were Train Operation & Human Factors, followed by nearly 27 percent which were Miscellaneous Contributing Factors. The latter category included highway collisions, inexperience, environmental conditions, highway-rail crossing accidents, inadequate training, object(s) on tracks, excessive noise, and driving under the influence (highway).

Slightly over 5 percent of all PCFs concerned Track, Roadbed & Structures, specifically irregular cross level of track, insufficient ballast section, and problems with engineering design or construction. Nearly 3 percent involved Mechanical & Electrical Failures, specifically defective steps on the outside of a rail car, and a defective coupler drawhead. (*See Appendix H, pie chart entitled "Major Possible Contributing Factor Categories Involved in 1997 Railroad Employee Fatalities."*)

- Of all the Train Operation & Human Factors, *two specific categories predominated*: Flagging, Fixed, Hand & Radio Signals (nearly 33 percent), and Miscellaneous Human Factors, Track (also nearly 33 percent).

The "Flagging, Fixed, Hand & Radio Signals" category included the absence of a fixed signal (blue signal), improper hand signal, improper radio communication, failure to give or receive radio communication, inappropriately using or failing to use the train's headlights, and inappropriately using or failing to use the train's horn.

The “Miscellaneous Human Factors, Track” category included inadequate fall protection, fouling the track, intercommunication problems affecting safety for workers on the tracks, non-compliance with on-track-safety rules, non-compliance with Roadway Protection Standards, track repair error, and errors by a Crane Operator and Flagman. *(See Appendix I, bar chart entitled “Train Operation & Human Factor Categories Involved in 1997 Railroad Employee Fatalities.”)*

- Three fourths of all Miscellaneous Contributing Factors involved inexperience/lack of training (30 percent), highway collisions, including driving under the influence (25 percent), or environmental conditions (20 percent).

OTHER SAFETY OBSERVATIONS

In four of the 28 fatalities (14 percent), major errors occurred in either notification of emergency service providers or post-accident toxicological testing procedures. Although these errors did not contribute to the relevant fatalities, they indicate a lapse in the implementation of accident response procedures and they could have prevented officials from obtaining the information necessary to understand how the fatalities occurred:

- In FE-19-97, the county emergency medical service did not receive a call until an hour after the fatality had been discovered. This delay occurred because the Train Dispatchers had difficulty identifying the appropriate emergency service provider for their jurisdiction. The railroad’s own police department, which could have facilitated this process, received delayed notification.
- In FE-22-97, the Contractors left the work site without locating the missing Flagman who had been working with their gang. The Conductor of a later through-train reported discovering the Flagman’s body 1½ hours after the Contractors had left the site.
- In FE-25-97, post-accident toxicological test results for the deceased were negative. However, FRA cited the carrier for violations regarding the post-accident toxicological testing process (49 CFR Part 219, Part C). The proper form was not completed; samples were not collected promptly; and the carrier did not make the kit available immediately.
- In FE-27-97, blood specimens harvested from the deceased under FRA authority were mailed to lab personnel, who found the vials broken upon arrival and canceled testing. Fortunately, the County Coroner’s office conducted tests under its own authority and released the results which were negative.